

## **WORKING DRAFT 12/3/13**

### **Recommendations on a Monitoring Program for Polybrominated Diphenyl Ethers (PBDEs) in Puget Sound - Fall 2013**

#### **Introduction**

PBDEs are a class of flame retardants that can be persistent, bioaccumulative, and toxic to both humans and wildlife. Phase-out regulations will prevent new PBDEs from being produced, which will help protect the environment from further contamination. However, PBDEs cannot be fully eliminated from the environment because they will continue to be released from in-use products.

During fall of 2013, the Environmental Protection Agency convened a sub-group of the Puget Sound Ecosystem Monitoring Program (PSEMP) Toxics Workgroup to design a monitoring scheme for PBDEs in Puget Sound. This was an interagency effort that included the Washington State Department of Ecology, the National Marine Fisheries Service, the Washington State Department of Fish and Wildlife, and the Puget Sound Institute.

#### **Recommendations**

##### ***1) Toxics in Fish & Sediment***

We strongly recommend maintaining existing long-term monitoring efforts: Chinook and Coho salmon, English Sole, Herring, and sediment.

We support monitoring for the Puget Sound Partnership's Vital Signs/Dashboard Indicators. These include **toxics in fish (Chinook and Coho salmon, English Sole, and Herring)**. The Vital Signs/Dashboard Indicators also includes monitoring of **contaminants in sediment**. Ecology's Marine Sediment Monitoring Team has measured PBDE levels in Puget Sound sediments since 2004. Locations include ten long-term monitoring stations and randomly selected stations from eight monitoring regions and six urban bays.

##### ***2) Marine Mammals: Southern Resident Killer Whales and Harbor Seals***

**Southern Resident Killer Whales** are protected under the Endangered Species Act. We recommend continued PBDE monitoring via NOAA's blubber biopsies and the University of Washington's Center for Conservation Biology's "Causes of Decline Among Southern Resident Killer Whales" program. **Harbor seal** monitoring is important for food web/bioaccumulation modeling. We recommend the continuation of the Washington Department of Fish and Wildlife's Harbor Seals Monitoring Program. These recommendations are consistent with the PSEMP Marine Mammal overall monitoring gap analysis and priorities.

##### ***3) Refine Loading Estimates***

According to Ecology and King County's Toxic Loadings Analysis, PBDEs reach Puget Sound via atmospheric deposition (44-56%), Publicly Owned Treatment Works (25-38%), and surface runoff (18%).

However, recent data suggests that current (Phase 3) loading estimates may be too low. We recommend additional monitoring to better capture PBDE loadings to Puget Sound.

#### ***4) Mussels***

We recommend continuing (Specific program name). These data shed light on whether higher contaminant levels in mussels are associated with certain types of land use and impervious surface. Mussel Watch provides the best matrix to examine PBDEs entering the nearshore ecosystem.

#### ***5) Water Column Concentrations***

We recommend a one-time sampling event to measure PBDE levels in water column concentrations, with the Strait of Juan de Fuca as the highest priority location, and interior locations in each of the basins and urban bays as next priority. These data would assist in calibrating models of fate, transport, and bioaccumulation.